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AGRO 4

Use of ion chromatography for analysis of macro-nutrients in Mehlich 1 extracts of unfertilized forest soils

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Ion chromatography (IC) is evaluated as an alternative to atomic absorption (AA) and inductively-coupled plasma spectrometry (ICP) for analysis of potassium (K), magnesium (Mg) and calcium (Ca), and as an alternative to antimonyl molybdate colorimetry and ICP for analysis of phosphorous (P) macro-nutrients in Mehlich 1 extracts. Soils typical of pine forests in the southeastern United States were tested. IC correlates well with AA and ICP for K and Ca, but not for Mg, unless conditions are chosen that resolve Mg from manganese (Mn). IC does not correlate very well with colorimetry for P at extract levels below 2 $mgKg^{-1}$ or in extracts with high levels of dissolved organic matter complexes of aluminum (Al) and iron (Fe). ICP results for P exceed both IC and colorimetry by 3-5 mgKg-1 for all soils tested. The merits of IC relative to AA, ICP, and colorimetry for forest soil testing are discussed.

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